

Assessment of stress, anxiety, and depression among the nursing personnel employed in tertiary care hospital during COVID-19 pandemic



Sonali Sain¹, Indira Dey², Sayanti Ghosh³

¹Associate Professor, Department of Community Medicine, B.S. Medical College and Hospital, Bankura, ²Professor, Department of Community Medicine, MSVP, NRS Medical College and Hospital, Kolkata, ³Professor, Department of Psychiatry, Murshidabad Medical College and Hospital, Berhampur, West Bengal, India

Submission: 23-11-2022

Revision: 02-03-2023

Publication: 01-04-2023

ABSTRACT

Background: Work related stress is an important occupational hazard among the forefront healthcare workers like nursing personnel. It is their demanding nature of occupation which exposes them to a higher risk of developing negative mental states. **Aims and Objectives:** Objectives of the study were to assess the stress, anxiety, and depression among the nursing personnel and their potential risk factors for stress, anxiety, and depression. **Materials and Methods:** A descriptive observational study was conducted among the nursing personnel employed in a tertiary care hospital in Kolkata. The data collection was done with the help of a predesigned pretested semi-structured questionnaire having information regarding socio demographic profile, history and personal history, and the questions from depression, anxiety and stress scale following permission from Institutional Ethics committee. The data were compiled, analyzed, and presented. **Results:** The present study found that 29.09%, 40% and 33.64% of the study subjects were suffering from depression, anxiety, and stress, respectively. Nuclear families, staying at hostel, nonspecific symptoms, COVID-19 exposure, and nonspecific symptoms were significant contributing factors for depression. COVID-19 exposure was significantly associated with anxiety. Nuclear families, presence of nonspecific symptoms were significant contributing factor for stress. No significant association was found with age, educational level, marital status, leisure activity, chronic morbidity, testing, and quarantine. **Conclusion:** Early assessment of the occupational stress, anxiety, and depression among the nursing personnel can initiate targeted intervention strategies. This would improve their personal and professional quality of life which affects the quality of health-care service.

Key words: Frontline worker; Healthcare; Psychological well-being; COVID-19

INTRODUCTION

Work related stress is found to be an important occupational hazard among the health-care service providers. Nursing personnel remain at the forefront of patient care. Their demanding nature of occupation exposes them to a higher risk of developing negative mental states such as depression, anxiety, and stress. Nursing personnel were thus found to be exposed to high level of job stress. This

not only impacts their health hazardously but also affects their performance ability. It is the personality of the concerned person which determines the person's response to stress.¹ Burn-out syndrome is conceptualized from chronic workplace stress that has not been successfully managed. It is characterized by three dimensions, for example, feelings of energy depletion or exhaustion; increased mental distance from one's job, or feelings of negativism or cynicism related to one's job, and reduced

Access this article online

Website:

<http://nepjol.info/index.php/AJMS>

DOI: 10.3126/ajms.v14i4.49772

E-ISSN: 2091-0576

P-ISSN: 2467-9100

Copyright (c) 2023 Asian Journal of Medical Sciences



This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

Address for Correspondence:

Dr. Sonali Sain, Associate Professor, Department of Community Medicine, B.S. Medical College and Hospital, Bankura, West Bengal, India. **Mobile:** +91-9433493466. **E-mail:** drsonalisain@gmail.com

professional efficacy.² Burnout thus explained the variance in compromised productivity and performance which affect the patient care quality. This has impact on risk in workplace, job satisfaction and both physical and mental health of nursing personnel.³ Work related stress can result from stressors, such as higher workloads, staff issues, including lack of resources, which was found to be associated with poor job satisfaction. Work related stress also can have detrimental effects on not only the performance ability and quality but also on the patients' safety.⁴ The prevalence of depression, anxiety, and stress among nursing personnel was found to be 32.4%, 41.2%, and 41.2%, respectively, in a study by Maharaj et al.⁵ The prevalence of burnout syndrome was found as 10.1% by Ribeiro et al., and 55.4% had a propensity to develop this syndrome.⁶ There were several variations in burden of occupational stress, anxiety, and depression in various countries. In a study, Ünver and Yenigün found that COVID-19 related fear was more in nurses employed in surgery ward, operation theatre, intensive care units and emergency service areas. COVID-19 related fear was found to be significantly correlated with age and duration of nursing experience but not with gender, marital status or educational status.⁷ Various challenges were faced by the nursing staffs in not only their workplace but also their society. Thus, the present study was conducted with the following objectives.

Aims and objectives

The objectives of the present study were to assess the stress, anxiety, and depression among the nursing personnel and to find out the potential risk factors for stress, anxiety, and depression among the study population, if any.

MATERIALS AND METHODS

An observational descriptive study was conducted among the nursing personnel serving their duty in NRS Medical College and Hospital in Kolkata over 6 months (January – June 2021). Eligible participants were all the nursing personnel serving their duty in NRS Medical College and Hospital. Using sample size formula of Z^2PQ/L^2 , taking prevalence (P) of 41.2% as prevalence of occupational stress among the nursing personnel,⁵ with $\alpha = 0.05$, and allowable error of 10%, and non-response rate of 10%; sample size was estimated to be 107. Thus total sample size of 110 nursing staffs was considered. The simple random sampling method was used to recruit participants. Those gave informed written consent to participate was included and those who were not willing to participate in the study, diagnosed cases of psychiatric illnesses and already on psychiatric medication, were excluded from the study. All the eligible participants were requested to fill

up the anonymous predesigned pretested semi structured questionnaire having two parts. First part contained the information regarding socio demographic profile, history and personal history, second part contained the questions from Depression, Anxiety, and Stress Scale (DASS-21).⁸ DASS 21 is a screening tool, not diagnostic tool. The reliability along with criterion, construct, factorial and procedural validity of DASS - 21 scale was evident in general population.⁹⁻¹¹ DASS-21 score for stress, anxiety, and depression for each participant was calculated according to the question number and points 0–3 was assigned to each response as it is a rating scale. Question number 1, 6, 8, 11, 12, 14, and 18 assigned for stress; 2, 4, 7, 9, 15, 19, and 20 for anxiety; and 3, 5, 10, 13, 16, 17, and 21 represents for depression. Total points obtained for each domain were multiplied by 2. Thus final score was assessed for stress, anxiety, and depression according to the following table (Table 1).

It was an anonymous survey and data confidentiality was assured.

Statistical analysis

Data were compiled after data collection and data cleaning. The analysis was done with help of MS Excel 8.0. Epi Info: Version: 7.2.2.6/February 02, 2018 and Statistical Package for the Social Sciences version 22 [IBM]. Both descriptive (frequency, percentages, mean, and standard deviation) and inferential statistics (Chi-square test and binary logistic regression analyses) were applied. In categorization of stress, anxiety, and depression, normal was considered as absent and all other categories as present. Chi-square tests along with Multiple Logistic Regression analysis were applied as the tests of significance. $P < 0.05$ considered significant.

Ethical issues

Ethical permission was obtained from Institutional Ethics committee. (No/NMC/7638 dated December 12, 2020). Anonymity of the participants and confidentiality of data were ensured to the study subjects. Although no efforts were taken to identify the study participants with poor score, study participants were briefed about the scoring system at the end of the questionnaire and encouraged to calculate their own score and seek medical help as required if the score was above the recommended score.

Table 1: Interpretation of DASS 21 scale

Grades acc. to DASS 21 scale	Depression	Anxiety	Stress
Normal	0–9	0–7	0–14
Mild	10–13	8–9	15–18
Moderate	14–20	10–14	19–25
Severe	21–27	15–19	26–33
Extremely severe	28+	20+	34+

RESULTS

In the present study, 110 nursing personnel participated in the study. It was found that 69 (62.73%) from urban areas, 21 (19.09%) stayed in hostel, 50(45.45%) from nuclear family, 35 (31.82%) single, 99 (90%) from Hindu and the rest from Muslim, Christian, Buddhist, Jain, and Sikh community. It revealed that 81(73.64%) exposed to COVID-19 patient either in family or in service, 51 (46.36%) quarantined, 20 (18.18%) tested for COVID-19, 9 (8.18%) with no leisure activity, 81(73.64%) suffered from any form of chronic illnesses, and 47 (42.73%) experienced recurrent symptoms in the form of nonspecific aches and pain, headache, indigestion, palpitation, shortness of breath, etc., over the past 14 days.

It was evident that 29.1%, 40%, and 33.64% suffered from stress, anxiety, and depression, respectively. Extremely severe presentations were more in anxiety (14.55%), followed by depression (8.18%) and stress (2.73%) (Figure 1).

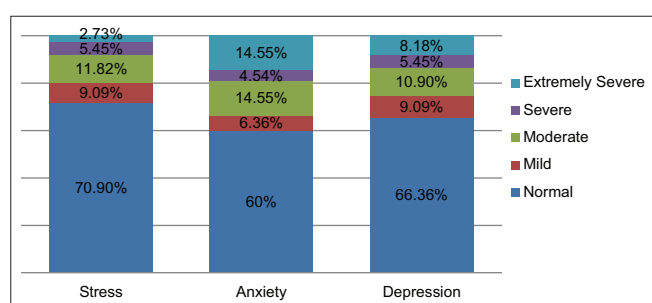


Figure 1: Distribution of stress, anxiety, and depression among the study population (n=110)

The participants staying at hostel were found to be significantly associated with suffering from depression but not stress and anxiety. Family type was significantly associated with stress and depression but not with suffering from anxiety. Living in nuclear family played important contributing factor. No significant association was found with age, educational level, marital status, and leisure activity (Table 2).

Presence of nonspecific recurring symptoms was found to be significantly associated with stress and depression. COVID-19 exposure history was also significantly associated with anxiety and depression but not with stress. No significant relationship was found between chronic morbidity, getting tested and quarantined with stress, anxiety, and depression (Table 3).

A logistic regression analysis was performed to ascertain effects of different attributes. The model explained variance of 26.8% in stress, 17.6% in anxiety, and 34.2% in depression among participants. Study subjects from joint family experienced 0.29 times significantly decreased risk of stress and protected with 0.24 times likelihood of depression. Those with history of quarantine for COVID-19 had 2.77 times of likelihood of depression (Table 4).

DISCUSSION

Nursing personnel played an important role in prevention and control of COVID-19 pandemic in spite of stressful environment and exposed to all kinds of occupational

Risk factors	Stress (n1=32)	P-value	Anxiety (n2=44)	P-value	Depression (n3=37)	P-value
	No (%)		No (%)		No (%)	
Age (n)						
≤25 years (10)	3 (30)		5 (50)		4 (40)	
25–35 years (75)	24 (32)	P=0.61	33 (44)	P=0.18	29 (38.67)	P=0.20
35–45 years (14)	2 (14.28)		2 (14.28)		2 (14.28)	
≥45 years (11)	3 (27.27)		4 (36.36)		2 (18.18)	
Educational level (n)						
Less than Graduate (68)	19 (27.94)		28 (41.17)		23 (33.82)	
Graduate (31)	9 (29.03)	P=0.85	12 (38.71)	P=0.94	10 (32.26)	P=0.97
Post Graduate and above (11)	4 (36.36)		4 (36.36)		4 (36.36)	
Current stay (n)						
Home (89)	24 (26.96)	P=0.31	34 (38.20)	P=0.43	25 (28.09)	P=0.01
Hostel (21)	8 (38.09)		10 (47.62)		12 (57.14)	
Family type (n)						
Nuclear (50)	22 (44)	P=0.00	24 (48)	P=0.12	23 (46)	P=0.01
Joint (60)	10 (16.67)		20 (33.33)		14 (23.33)	
Marital status (n)						
Single (35)	13 (37.14)	P=0.20	15 (42.86)	P=0.67	14 (40)	P=0.33
Married (75)	19 (25.33)		29 (38.67)		23 (30.67)	
Leisure activity (n)						
Present (101)	31 (30.69)	P=0.21	43 (42.57)	P=0.06	36 (35.64)	P=0.14
Absent (9)	1 (11.11)		1 (11.11)		1 (11.11)	

Table 3: Distribution of study subjects acc. to their mental status and past medical records (n=110)

Past medical records	Stress (n1=32)		P-value	Anxiety (n2=44)		P-value	Depression (n3=37)		P-value
	No (%)			No (%)			No (%)		
History of COVID-19 exposure (n)									
Yes (81)	26 (32.09)		P=0.25	38 (46.91)		P=0.01	33 (40.74)		P=0.00
No (29)	6 (20.69)			6 (20.69)			4 (13.79)		
History of getting quarantined (n)									
Yes (51)	11 (21.57)		P=0.11	20 (39.21)		P=0.88	13 (25.49)		P=0.09
No (59)	21 (35.59)			24 (40.68)			24 (40.68)		
History of getting tested for COVID-19 (n)									
Yes (20)	5 (25)		P=0.66	9 (45)		P=0.61	7 (35)		P=0.89
No (90)	27 (30)			35 (38.89)			30 (33.33)		
Presence of nonspecific symptoms (n)									
Yes (47)	20 (42.55)		P=0.00	21 (44.68)		P=0.39	21 (44.68)		P=0.03
No (63)	12 (19.05)			23 (36.51)			16 (25.39)		
Presence of chronic morbidity (n)									
Yes (29)	9 (31.03)		P=0.78	10 (34.48)		P=0.48	7 (24.13)		P=0.21
No (81)	23 (28.39)			34 (41.97)			30 (37.08)		

Table 4: Association of various attributes with stress, anxiety, and depression (n=110)

Attributes	Stress (n1=32)		Anxiety (n2=44)		Depression (n3=37)	
	AOR	P-value	AOR	P-value	AOR	P-value
Age	0.79	0.57	0.77	0.48	0.84	0.67
Educational level	0.71	0.41	0.76	0.46	0.73	0.46
Current stay	0.89	0.88	1.06	0.92	2.91	0.14
Family type	0.29	0.00	0.47	0.08	0.24	0.00
Current marital status	0.84	0.75	1.54	0.39	1.59	0.41
Leisure activity	3.38	0.34	6.58	0.10	11.12	0.08
Non-specific symptoms	2.99	0.06	1.38	0.52	2.21	0.16
Chronic morbidity	0.86	0.80	0.82	0.72	0.41	0.16
COVID-19 exposure	0.62	0.47	0.33	0.05	0.31	0.09
COVID-19 testing	1.25	0.74	0.69	0.53	0.77	0.69
Quarantined for COVID-19	2.38	0.09	1.46	0.40	2.77	0.04

hazards. An observational study was conducted in tertiary care hospital to assess this hazard.

Stress

The present study assessed that 29.1% of the nursing personnel were suffering from stress. However, Sharma *et al.*, found that 42% was suffering from moderate to severe stress in a medical institute in Meerut.¹ Nurses employed in hospitals of Mysore city experienced both moderate general stress (49.8%) and perceived stress (55.4%) as found by Kshetrimayum *et al.*¹² It was elicited by Faremi *et al.*, that increased work intensity can lead to work related stress among the nurses. This indirectly affected the quality and quantity of the services provided.¹³ In a study, Maharaj *et al.*, observed that 41.2% of Australian Nurses were suffering from stress.⁵ A study in Turkey elicited that 62 % of all ICU nurses were suffering from moderate level and 20% from high perceived level of occupational stress during COVID-19 pandemic.¹⁴ The present study found that participants of 35–45 years were less affected by occupational stress, compared to other age groups, but not statistically significant. Age was found to be significantly associated with occupational stress in a comparative study,

conducted in COVID-19 Triage and non-triage non isolation hospital in Egypt in April 2020.¹⁵ A study among Greek nurse confirmed that age was statistically significant contributor to occupational stress.¹⁶ Present study found that highly educated nursing personnel were more stressed. But Said and El-Shafei noted that occupational stress is more among the less educated nursing personnel. The people with higher educational level were somehow protected from the occupational stress.¹⁵ Similar finding was also observed in Wuhan city.¹⁷ The present study observed that staying away from family was an important stressor. However, living with colleague led to more risk of stress (OR=1.62) compared to living with family among Hubei pediatric nurses.¹⁸ Participants from nuclear family suffered significantly from occupational stress as living with joint family could not protect them. Poor social supports along with difficult relationship were significantly associated with occupational stress of the nurses in the Sichuan Province and Wuhan City during Covid-19 outbreak (OR=1.45).¹⁹ The high stress score was elicited to be prevalent by Said and El-Shafei in currently single nursing personnel compared to the married ones in Egypt, like present study.¹⁵ In a study, Chatzigianni *et al.*, observed

that age and single status of Greek nursing personnel was important stressor to the occupational stress.¹⁶ Separated nursing personnel were maximally affected by occupational stress in Wuhan city, followed by unmarried and married one.¹⁷ But Marijanović *et al.*, observed no statistically significant difference in levels of stress between currently married and single healthcare workers.²⁰ This might be due to incapability of sharing of stress to other family members and not getting emotional support from them. Present study noticed that leisure activity helped to relieve occupational stress and exposure to Covid-19 infection led to stress. It was found that, Zheng *et al.*, also observed stress due to exposure to suspect or confirmed cases of Covid-19 infection (OR=1.7).¹⁸ In a study, Marijanović *et al.*, elicited that 44% of the healthcare and administrative workers from 5 oncology institutions in Bosnia and Herzegovina (BiH) had contact with COVID-19 infection in December 2020. However, there was no statistically significant difference in the stress scores with exposure to COVID-19 infection.²⁰ The occupational stress was found to be significantly higher among the COVID-19 exposed nurses than non-exposed group in Iran during pandemic (P=0.006 and P=0.002, respectively).²¹ Those study population, not quarantined or not tested, were found to be more stressed, but association was not statistically significant. This was due to their apprehension of the consequences following exposure to COVID-19 patients. The participants with nonspecific signs and symptoms were significantly prone to stress. Chronically morbid participants were likely to suffer from serious adverse events and thus at risk to occupational stress. In a study, Zheng *et al.*, also observed that the nursing personnel with chronic morbidity were at increased risk of stress (OR=2.2).¹⁸ It was noticed that co morbidity and hospitalization were considered as influencing factors for occupational stress by Hoseinabadi *et al.*²¹ A study in China observed that perceived health status of unknown origin (OR=1.52), fear of infection (OR=1.1), poor social support (OR=1.28), and family members' relationship (OR=4.985) were significantly associated with the occupational stress,¹⁹ whereas present study found family type as an attribute on logistic regression analysis.

Anxiety

The present study found that 40% of the study subjects were suffering from anxiety. In a study, Labrague and Santos also identified dysfunctional levels of COVID-19 related anxiety among 37.8% registered nurses from the Philippines.²² Similar finding by Maharaj *et al.*, as 41.2% of Australian Nurses were suffering from anxiety acc. to DASS-21.⁵ A study found that nurses from city hospitals of Gansu Province of northwest China, who faced the outbreak were at risk of anxiety during COVID-19 pandemic.²³ A systematic review and meta-analysis by Maqbali *et al.*, assessed the impact of COVID-19 pandemic

on stress, anxiety, depression, and sleep disturbance among nurses. The pooled prevalence of anxiety was 37% (95% CI 32–41).²⁴ Lower the age group, higher was the occurrence of anxiety among the participants of present study. However, Shen *et al.*, found that age of the nursing staffs in Taiwanese hospitals significantly intensified anxiety and parasympathetic activity.²⁵ The present study found that anxiety was more among the less educated participants. Staying separately from family was an important factor for anxiety, as observed by both present study and Zheng *et al.*, researcher observed that living with a colleague led to more anxiety (OR=1.32) among Hubei pediatric nurses.¹⁸ Nursing staffs, separated from family members faced problems as they could not get support from family members during the pandemic. This may led to more anxiety disorder among those who were staying at hostels. No statistically significant difference in levels of anxiety has been observed by Marijanović *et al.*, between currently married and single healthcare workers.²⁰ However, the present study elicited that anxiety was common among single. It might be due to absence of protective factor of being with family. Study subjects with leisure activity were prone to anxiety, as anxious ones were likely to adopt leisure time activities to reduce their anxiety. The participants with history of exposure to COVID-19 infections were significantly encountered with anxiety. Comparable risk of anxiety (OR=2.1) was noticed by Zheng *et al.*, among the nursing personnel coming in contact with COVID-19 infection.¹⁸ Contrary to the above finding, Marijanović *et al.*, observed no statistically significant difference in the anxiety score among the study subjects with and without exposure to COVID-19 infection.²⁰ No significant association was found between risk of anxiety and history of quarantine and COVID-19 testing. Although present study could not elicit significant association between risk of anxiety and chronic morbidity, Zheng *et al.*, elicited that the nursing personnel comorbidity was at risk of anxiety (OR=2.0).¹⁸ The presence of comorbidity increased the likelihood of anxiety due to the concern about adverse outcome of COVID-19 infection in patient with comorbidity. Societal support, personal resilience, and organizational support inversely predicted occupational anxiety among the registered nurses from the Philippines during COVID-19 pandemic, but not for nurse's personal characteristics.²² History of COVID-19 exposure led to more anxiety among the nursing personnel on logistic regression analysis, similarly in Sichuan Province and Wuhan city.¹⁹

Depression

The present study elicited that 33.6% of nursing personnel were suffering from depression. On meta-analysis, 43.83% (95% CIs: 40.26–47.42%) of participants from China was suffering from different levels of depression. It was more common in middle age group (30–40 years) population.²⁶

However, the present study showed that depression was common in younger age group like 25–35 years, staying away from home ($P=0.01$). Hubei pediatric nurses living with colleague were at more risk of depression ($OR=1.82$) compared to those living with family.¹⁸ Participants living in nuclear family were at risk of depression ($P=0.01$). Married study population was protected from depression, but no statistically significant association. Similarly Marijanović *et al.*, found no statistically significant difference in levels of depression.²⁰ History of exposure to COVID-19 infected patients significantly led to depression as evident in the present study. In a study, Zheng *et al.*, observed that nursing personnel with the suspected or confirmed exposure to COVID-19 infection were at risk of depression ($OR=1.5$).¹⁸ No statistically significant difference in depression was found between with and without exposure to Covid-19 infection by Marijanović *et al.*²⁰ Chronically morbid study subjects were at risk of depression. The nursing personnel with comorbidity were at risk of depression in Hubei ($OR=2.3$).¹⁸ Depression was found to be more pertinent among those quarantined for COVID-19, as found among the nurses working in Wuhan hospitals.¹⁹

Limitations of the study

DASS 21 was used as screening tool for assessment of occupational stress. As it was an anonymous questionnaire thus screen positive subjects could not be identified. Thus those at risk subjects could not be referred. But after data collection, the scoring method was described at the end of questionnaire. Study subjects were requested to self-assess the score and ask for medical help if required. It was only conducted in one medical college thus generalization of results were compromised. Thus large studies involving all levels of health-care delivery system should be conducted in the future. This will help to assess the true burden of occupational stress, anxiety, and depression across all categories of nursing personnel.

CONCLUSION

The current study captured the vulnerabilities of nursing personnel during stressful scenario like COVID-19 pandemic. This can compromise the quality of health-care service delivery. Targeted intervention strategies can be developed to improve their personal and professional quality of life to reduce their vulnerabilities. Effective intervention can ensure provision of quality of health care services. Thus, lesson learnt can be utilized for dealing with future pandemic.

ACKNOWLEDGMENT

All participating nursing personnel.

REFERENCES

- Sharma P, Davey A, Davey S, Shukla A, Shrivastava K and Bansal R. Occupational stress among staff nurses: Controlling the risk to health. *Indian J Occup Environ Med.* 2014;18(2):52-56. <https://doi.org/10.4103/0019-5278.146890>
- Burn-out an “occupational phenomenon”: International Classification of Diseases 2. Available from: https://www.who.int/mental_health/evidence/burn-out/en [Last accessed on 2020 Nov 30].
- Khamisa N, Oldenburg B, Peltzer K and Ilic D. Work related stress, burnout, job satisfaction and general health of nurses. *Int J Environ Res Public Health.* 2015;12:652-666. <https://doi.org/10.3390/ijerph120100652>
- Golubic R, Milosevic M, Knezevic B and Mustajbegovic J. Work-related stress, education and work ability among hospital nurses. *J Adv Nurs Adv Nurs.* 2009;65(10):2056-2066. <https://doi.org/10.1111/j.1365-2648.2009.05057.x>
- Maharaj S, Lees T and Lal S. Prevalence and risk factors of depression, anxiety, and stress in a cohort of Australian nurses. *Int J Environ Res Public Health.* 2019;16(1):61. <https://doi.org/10.3390/ijerph16010061>
- Ribeiro VF, Filho CF, Valenti ER, Ferreira M, de Abreu LC, de Carvalho TD, *et al.* Prevalence of burnout syndrome in clinical nurses at a hospital of excellence. *Int Arch Med.* 2014;7:22. <https://doi.org/10.1186/1755-7682-7-22>
- Ünver S and Yenigün SC. COVID-19-19 fear level of surgical nurses working in pandemic and surgical units. *J Perianesth Nurs.* 2021;36(6):711-716. <https://doi.org/10.1016/j.jpnan.2021.04.014>
- Depression, Anxiety and Stress Scale (DASS-21). Available from <https://www.workcover.wa.gov.au/wp-content/uploads/sites/2/2015/07/3.dass21withscoringinfo> [Last accessed on 2020 Nov 30].
- Gloster AT, Rhoades HM, Novy D, Klotsche J, Senior A, Kunik M, *et al.* Psychometric properties of the depression anxiety and stress scale-21 in older primary care patients. *J Affect Disord.* 2008;110(3):248-259. <https://doi.org/10.1016/j.jad.2008.01.023>
- Le MTH, Tran TD, Holton S, Nguyen HT, Wolfe R and Fisher J. Reliability, convergent validity and factor structure of the DASS-21 in a sample of Vietnamese adolescents. *PLoS One.* 2017;12(7):e0180557. <https://doi.org/10.1371/journal.pone.0180557>
- Alfonsson S, Wallin E and Maathz P. Factor structure and validity of the depression, anxiety and stress scale-21 in Swedish translation. *J Psychiatr Ment Health Nurs.* 2017;24(2-3):154-162. <https://doi.org/10.1111/jpm.12363>
- Kshetrimayum N, Bennadi D and Siluvai S. Stress among staff nurses: A hospital based study. *J Nat Sci Med.* 2019;2:95-100. https://doi.org/10.4103/JNSM.JNSM_24_18
- Faremi F, Olatubi M, Adeniyi KG and Salau OR. Assessment of occupational related stress among nurses in two selected hospitals in a city South Western Nigeria. *Int J Afr Nurs Sci.* 2019;10:68-73. <https://doi.org/10.1016/J.IJANS.2019.01.008>
- Şanlıtürk D. Perceived and sources of occupational stress in intensive care nurses during the COVID-19 pandemic. *Intensive Crit Care Nurs.* 2021;67:103107. <https://doi.org/10.1016/j.iccn.2021.103107>
- Said RM and El-Shafei DA. Occupational stress, job satisfaction,

- and intent to leave: Nurses working on front lines during COVID-19-19 pandemic in Zagazig City Egypt. *Environ Sci Pollut Res Int.* 2021;28(7):8791-8801.
<https://doi.org/10.1007/s11356-020-11235-8>
16. Chatzigianni D, Tsounis A, Markopoulos N and Sarafis P. Occupational stress experienced by nurses working in a Greek regional hospital: A cross-sectional Study. *Iran J Nurs Midwifery Res.* 2018;23(6):450-457.
https://doi.org/10.4103/ijnmr.IJNMR_120_17
 17. Zhan Y, Ma S, Jian X, Cao Y and Zhan X. The current situation and influencing factors of job stress among frontline nurses assisting in Wuhan in fighting COVID-19. *Front Public Health.* 2020;8:579866.
<https://doi.org/10.3389/fpubh.2020.579866>
 18. Zheng R, Zhou Y, Qiu M, Yan Y, Yue J, Yu L, et al. Prevalence and associated factors of depression, anxiety, and stress among Hubei pediatric nurses during COVID-19 pandemic. *Compr Psychiatry.* 2021;104:152217.
<https://doi.org/10.1016/j.comppsy.2020.152217>
 19. Zheng R, Zhou Y, Fu Y, Xiang Q, Cheng F, Chen H, et al. Prevalence and associated factors of depression and anxiety among nurses during the outbreak of COVID-19 in China: A cross-sectional study. *Int J Nurs Stud.* 2021;114:103809.
<https://doi.org/10.1016/j.ijnurstu.2020.103809>
 20. Marijanović I, Kraljević M, Buhovac T, Cerić T, Abazović AM, Alidžanović J, et al. Use of the depression, anxiety and stress scale (DASS-21) questionnaire to assess levels of depression, anxiety, and stress in healthcare and administrative staff in 5 oncology institutions in Bosnia and Herzegovina during the 2020 COVID-19 pandemic. *Med Sci Monit.* 2021;27:e930812.
<https://doi.org/10.12659/MSM.930812>
 21. Hoseinabadi TS, Kakhki S, Teimori G and Nayyeri S. Burnout and its influencing factors between frontline nurses and nurses from other wards during the outbreak of coronavirus disease-COVID-19 in Iran. *Invest Educ Enferm.* 2020;38(2):e3.
<https://doi.org/10.17533/udea.iee.v38n2e03>
 22. Labrague LJ and Santos JA. COVID-19-19 anxiety among front-line nurses: Predictive role of organisational support, personal resilience and social support. *J Nurs Manag.* 2020;28(7):1653-1661.
<https://doi.org/10.1111/jonm.13121>
 23. Han L, Wong FK, She DL, Li SY, Yang YF, Jiang MY, et al. Anxiety and depression of nurses in a North West Province in China during the period of novel coronavirus pneumonia outbreak. *J Nurs Scholarsh.* 2020;52(5):564-573.
<https://doi.org/10.1111/jnu.12590>
 24. Al Maqbali M, Al Sinani M and Al-Lenjawi B. Prevalence of stress, depression, anxiety and sleep disturbance among nurses during the COVID-19 pandemic: A systematic review and meta-analysis. *J Psychosom Res.* 2021;141:110343.
<https://doi.org/10.1016/j.jpsychores.2020.110343>
 25. Shen SH, Yen M, Yang SL and Lee CY. Insomnia, anxiety, and heart rate variability among nurses working different shift systems in Taiwan. *Nurs Health Sci.* 2016;18(2):223-229.
<https://doi.org/10.1111/nhs.12257>
 26. Xie N, Qin Y, Wang T, Zeng Y, Deng X and Guan L. Prevalence of depressive symptoms among nurses in China: A systematic review and meta-analysis. *PLoS One.* 2020;15(7):e0235448.
<https://doi.org/10.1371/journal.pone.0235448>

Authors' Contributions:

SS - Concept and design of study, reviewed the literature, interpreted results, statistical analysis, and prepared first draft of manuscript; **ID** - Concept and coordination, interpretation of findings, and revision of manuscript; **SG** - Concept and coordination, interpretation of findings, and revision of manuscript.

Work attributed to:

NRS Medical College and Hospital, Kolkata - 700 014, West Bengal, India.

Orcid ID:

Sonali Sain - <https://orcid.org/0000-0002-7563-8856>

Indira Dey - <https://orcid.org/0000-0003-4184-0295>

Sayanti Ghosh - <https://orcid.org/0000-0002-7227-556X>

Source of Support: Nil, **Conflict of Interest:** None declared.